

**Oroville Facilities Relicensing  
(Project No. 2100)**

**Interim Report for SP-F3.2**

**SP-F3.2, Evaluation of Project Effects on Non-salmonid Fish in the Feather River  
Downstream of the Thermalito Diversion Dam**

**Task 3A—Identify Green Sturgeon Distribution and Habitat Use Patterns**

**December 2002**

**SUMMARY**

Divers searched for sturgeon downstream of potential migration barriers on the Feather River twice during summer 2002. No sturgeon were found. Consequently, no radio tagging or tracking was performed. Surveys for sturgeon eggs and larvae were conducted in July and August at four stations in the Low Flow Channel. No sturgeon were collected.

**BACKGROUND**

This interim report addresses Task 3A of Oroville Facilities Relicensing Study Plan F3.2, *Evaluation of Project Effects on Non-salmonid Fish in the Feather River Downstream of the Thermalito Diversion Dam*. Major elements of Task 3A include adult upstream passage and sturgeon distribution and habitat characteristics. The adult upstream passage effort includes expert assessment of potential sturgeon passage impediments and exploratory scuba surveys. The sturgeon distribution and habitat characteristics include radio tagging and tracking and sturgeon egg and larval study.

The report covers exploratory scuba surveys, radio tagging and tracking, and egg and larval surveys for sturgeon in the 2002 field season. Figure 1 illustrates the scuba and egg and larval survey locations and identifies major features of the lower Feather River. The primary author is Alicia Seesholtz of the California Department of Water Resources (DWR), who may be reached at (916) 227-7539 and [aseeshol@water.ca.gov](mailto:aseeshol@water.ca.gov).

**PRELIMINARY RESULTS**

**Exploratory Scuba Surveys**

Task 3A states: "Exploratory scuba surveys will be conducted to estimate whether adult sturgeon are holding downstream of potential upmigration barriers. Twice during the summer months (May/June and July, 2002 and 2003), NMFS scuba divers intend to dive just downstream of Shanghai Bench, Sunset Pumps, and at the pools downstream of the riffles in the reach one to two miles upstream of the Thermalito Afterbay outlet looking for adult sturgeon (both green and white)."

The National Marine Fisheries Service (NMFS) conducted two scuba surveys in the lower Feather River in 2002, one each on June 6 and July 30. No sturgeon were seen during either survey.

#### June 6, 2002 Scuba Survey Results

The first survey consisted of two dives, one each at Sunset Pumps (about RM 38.5) and the Fish Barrier Dam (RM 67). A third site, Shanghai Bench (about RM 25.5), was scheduled for survey, but strong current and poor visibility made diving unsafe. The dive team consisted of Jon Mann, Steve Thomas, David White and Kurt Dreftak. It was 90°F with clear skies and no wind. The purposes of this survey were to look at Sunset Pumps as a potential migration barrier to sturgeon, look for green sturgeon and note habitat type.

Sunset Pumps: Dive 1 took place for 25 minutes in 66°F water with a visibility of 1-2 feet. Maximum depth was 17 feet. The initial dive was made in a backwater pool area on the south side of the river below the Sunset Pumps barrier. The current below the barrier was too strong to dive safely and was avoided. Visibility was so poor that only the mud and rock substrate and some woody debris could be seen. Divers thought the falls might present a partial migration barrier at that day's flow rate.

Fish Barrier Dam: Dive 2 took place for 40 minutes in 53°F water with a visibility of 20 feet. Maximum depth was 32 feet. The initial dive was made from shore and continued to the falls below the dam. A 32-foot deep pool began at the falls and extended 20 feet downstream. Another 32-foot pool was near the rocks under Table Mountain Bridge. The substrate was a mixture of rock, ranging in size from pebbles to boulders, and bedrock. The bottom contour was varied, with equal amounts of flat to steep rock faces. There were many large boulders and pieces of concrete debris. Adult salmon, juvenile salmonids, crayfish, tule perch, sculpin and shad were seen.

#### July 30, 2002 Scuba Survey Results

Fish Barrier Dam: The dive team consisted of Jon Mann and David White. It was 90°F with clear skies and no wind. Additional purposes of this survey were to help DWR staff test sturgeon radio tags and deploy egg and larval shelters.

The combined dive objectives took 85 minutes in 53°F water with a visibility of 15 feet. Maximum depth was 33 feet. An underwater video camera was used to obtain footage of underwater habitat and fish species. Adult salmon, juvenile salmonids, perch, sculpin and crayfish were seen, as well as several salmon carcasses. Radio tags were placed in a deep hole to determine receiving range ability as affected by depth within a rocky substrate. Dave and Jon dragged shelters into the deepest holes under the bridge to assure they were all spread out and face up (see below for description and results). As before, the substrate consisted of various sizes of rocks and boulders, and large concrete debris. The bottom contour was varied.

## **Radio Tagging and Tracking**

No radio tagging or tracking of sturgeon was conducted in 2002, since none were seen or caught.

## **Egg and Larval Surveys**

Task 3A states: "Egg and larval sampling for sturgeon will occur in the spring of 2003 between the Fish Barrier Dam and Boyd's Pump, approximately two miles downstream of Shanghai Bend, and may extend as far downstream as Verona."

Sturgeon egg and larval surveys were conducted in July and August of 2002 as a trial run ahead of the 2003 spawning season. No sturgeon eggs or larvae were collected, but numerous small benthic animals (sculpin and crayfish) used the shelters. Thus, the method seems promising for use in collecting larval sturgeon.

Surveys took place in the Low Flow Channel at Robinson Riffle (RM 62), Steep Riffle and Pool (RM 61), Eye Riffle and Pool (RM 60), and the Fish Barrier Dam (RM 67). Each set consisted of five shelters suspended six feet apart, all attached to a main line. Due to vandalism and shelter loss, only four shelters were used per line at the Fish Barrier Dam. The main line was weighted on one end and had a float suspended approximately 3-6 feet under the surface of the water on the other end. Water temperatures ranged from 53°F to 60°F. Depth of traps ranged from 9 ½ - 30 feet. Robinson, Steep, and Eye shelters were set on substrate consisting of sand and rock mixtures. Fish Barrier Dam substrate was rock.

## **Larval Survey Results**

### *July 15-16, 2002 at Robinson Riffle and Steep Pool*

One set was made mid-channel below Robinson Riffle on July 15-16, 2002. It was approximately 16 feet deep with a surface temperature of 58°F and a bottom temperature of 57°F. Substrate consisted of sand and rocks with some vegetation. Seven signal crayfish and four prickly sculpin were caught.

A second set was made river-right in the mainstem channel at Steep Pool. It was approximately 10'6" deep with a surface temperature of 60°F and a bottom temperature of 58°F. Substrate consisted of sand and rocks. Upon retrieval, the traps were discovered on the other side of the channel due to strong flows. One prickly sculpin was caught.

### *July 16-18, 2002 at Robinson and Eye Riffles*

One set was made mid-channel below Robinson Riffle on July 16-18, 2002. It was approximately 15 feet deep with surface temperatures of 58-59°F and bottom temperatures of 57-59°F. Substrate consisted of sand and rocks. Thirteen signal crayfish and ten prickly sculpin were caught.

A second set was made mid-channel in the mainstem channel at Eye Pool.

It was approximately 10' 6" deep with a surface temperature and a bottom temperature of 60°F. Substrate consisted of sand and rocks. There was no catch.

*July 18–22, 2002 at Robinson Riffle and Eye Pool*

One set was made mid-channel below Robinson Riffle on July 18-22, 2002. It was 14'4" deep with surface temperatures ranging from 57-59°F and a bottom temperature of 59°F. Substrate consisted of sand and rocks. Upon retrieval, the traps were found out of the water and vandalized.

A second set was made mid-channel in the mainstem channel at Eye Pool. It was approximately 9' 6" deep with a surface temperature of 60°F. Substrate consisted of sand and rocks. Four signal crayfish, three prickly sculpin and one riffle sculpin were caught.

*July 30-August 6, 2002 at the Fish Barrier Dam*

One set was made river-left, directly below the Table Mountain Bridge, on July 30 - August 18, 2002. It was approximately 30 feet deep with surface and bottom temperatures of 56°F. Substrate consisted of 4-10" diameter rocks. There was no catch.

A second set was made river-left on the edge of a cove directly upstream of the Table Mountain Bridge. It was approximately 30 feet deep with a surface temperature of 56°F and a bottom temperature of 53°F. Substrate consisted of 4-10" sized rocks. There was no catch.

FIG. 1. Scuba and egg and larval survey locations for sturgeon in the lower Feather River.

